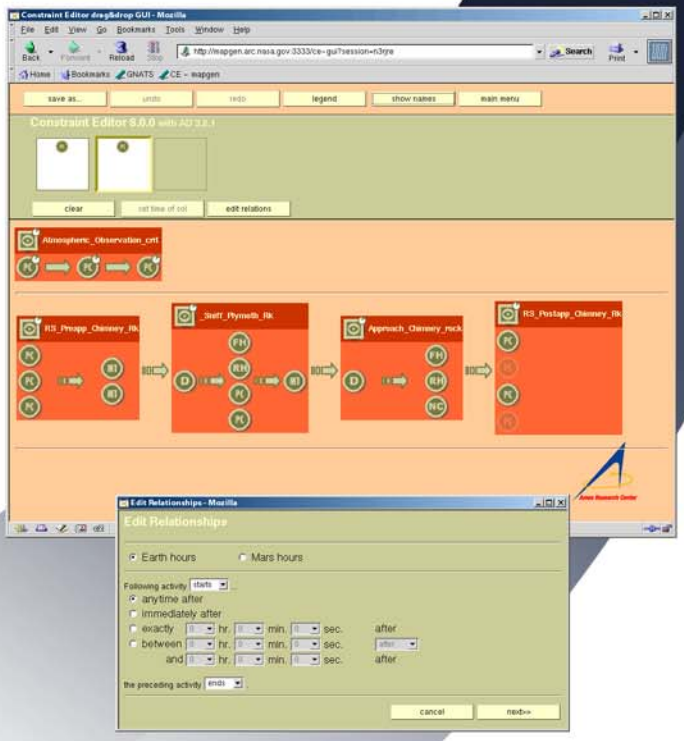
MAPGEN

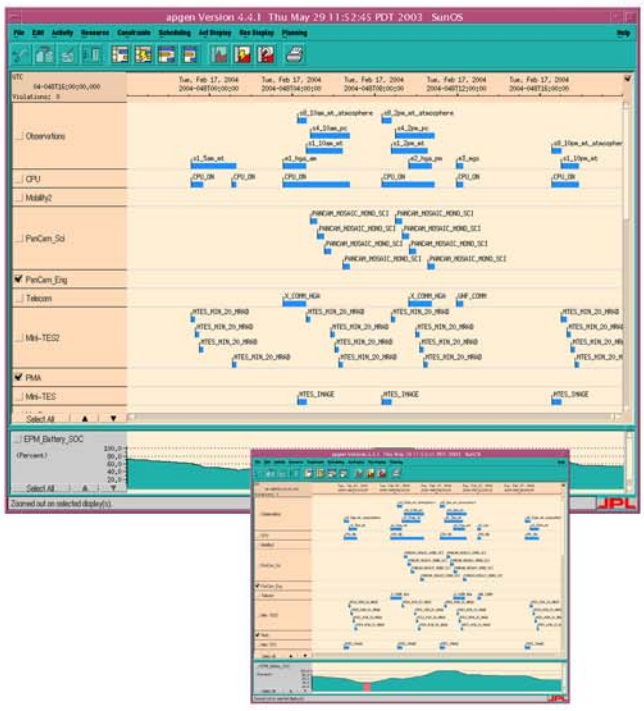
NASA Ames Research Center Computational Sciences Division

MAPGEN (Mixed Initiative Activity Planning Generator) is a ground-based decision support system developed for the Mars Exploration Rover Mission (MER). This mission-critical system provides the operations team with automatic planning and scheduling that significantly accelerates the daily planning process and the amount of science planned on the Martian surface each day.

MAPGEN brings to bear an advanced artificial intelligence capability to enable human operators to reorder and constrain science goals consistent with mission and flight constraints, enabling them to produce a conflict-free plan to execute onboard the two MER rovers.

Working with the human operator, MAPGEN gives computers the intelligence to take care of many of the details involved with building a plan that will accomplish a set of given goals. Throughout the MER Mission, MAPGEN is used to build and refine activity plans, taking into account hundreds of constraints when it lays out a schedule. MAPGEN ensures that the plan it generates is well within the bounds of resources available onboard the rover, such as battery power, and enforces science constraints.





MAPGEN Features

- Automatic generation of plans and schedules for scientific and engineering activities
- Testing of hypotheses, or "what-if" analyses of various scenarios
- Enables people to edit plans and even override some constraints when required
- Computation and analysis of resources
- Enforcement and maintenance of constraints, including resolution of temporal and resource conflicts among planned activities

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